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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/901,837

07/10/2001

Shubneesh Batra

MCRO:199--3/FLE  
95-0057.0

9030

7590

09/10/2004

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EXAMINER

EVERHART, CARIDAD

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 09/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Advisory Action</b>	<b>Application No.</b> 09/901,837	<b>Applicant(s)</b> BATRA ET AL.	
	<b>Examiner</b> Caridad M. Everhart	<b>Art Unit</b> 2825	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 17 August 2004 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE. Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

**PERIOD FOR REPLY** [check either a) or b)]

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on \_\_\_\_\_. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
  - (b) ☐ they raise the issue of new matter (see Note below);
  - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
  - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_.

3. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.
4. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: please see attached response to arguments.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☐ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: \_\_\_\_\_.

Claim(s) objected to: \_\_\_\_\_.

Claim(s) rejected: \_\_\_\_\_.

Claim(s) withdrawn from consideration: \_\_\_\_\_.

8. ☐ The drawing correction filed on \_\_\_\_\_ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☒ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). 08312004.
10. ☒ Other: attachment pages 2 and 3 , response to arguments

### Response to Arguments

Applicant has argued that Kawano does not teach the limitation "only during about the last 30% of the deposition of the conductor layer, said impurity layer having a melting point temperature and surface tension less than that of said conductor". And "heating the conductor layer to a reflow temperature". Applicant has further argued that Kawano does not suggest the lowering of the melting point is caused by the metal.

These arguments are respectfully found not persuasive for the following reasons.

The meaning of the word "during" is understood from Merriam Webster's Collegiate Dictionary, 10<sup>th</sup> edition, 1997: "at a point in the course of." Therefore, as seen in Fig. 2F (Kawano) a Ti metal film 64 (col. 8, lines 23-30) is formed after the Al plug is 0.85 micron tall in an opening 1 micron in height (col. 7, lines 50-63), which is after the plug has been filled more than 70% of the height, which satisfies the limitation of the claim. With respect to the lowering of the melting point, titanium is taught, which is one of the impurities which is disclosed by applicant's specification, so that it is believed that the melting point limitation is satisfied. It is respectfully disagreed that Kawano does not suggest that the metal causes lowering of the melting point. Kawano describes the metal film, in the case of the embodiment described it is a titanium metal film, as an active metal film (col. 3, lines 44-47), and the purpose is described as to reflow the aluminum and completely fill the hole and planarize the film. This implies that the active metal film does aid in the reflowing and the filling of the hole. The explanation given by Kawano concerning the grain size does not change the patentability or unpatentability of applicant's claim because the mechanism proposed by Kawano may take place in addition to the

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diffusion of titanium into the aluminum which takes place. As evidence that the titanium would diffuse into aluminum is offered "Roles of Ti-intermetallic compound layers on the electromigration resistance of Al-Cu interconnecting stripes" by C.-C. Lee, et al. which shows that there is diffusion of the Ti on page 5880, the third paragraph, for example discusses diffusion of Ti in the AlCu.

C. Everhart  
9/5/04

  
CARLOS D EVERHART  
PRIMARY EXAMINER